CALENDAR OF EVENTS—
PAGE 3

MEETINGS:

November 14 & 15, 1981 Personal Computer Fair at the Pacific Science Center, Seattle Center.

November 19, Informal meeting with no speaker scheduled.

December 3, ''Getting Started In Personal Computers;'' a panel discussion.

December 17, Informal meeting with no speaker scheduled.

Northwest
Computer News

VOL. 6 NO. 10 A PUBLICATION OF THE NORTHWEST COMPUTER SOCIETY SPECIAL ISSUE, 1981

Washington & Electronics

THE following is a discussion of the efforts of the State of Washington to further the development of electronics-related industrial development in the State. It was presented to a section meeting of IEEE by Mr. Richard Shrock, director of the Washington State Economic Development Department. The Department has roughly 45 people and a budget of 2 million dollars annually. Almost all state-funded, it performs with a broad mandate to improve the economic well-being of the citizens of the State. Tourism, promotion, industrial development, international business, foreign trade, and small business development are areas of activity.

Almost everyone has heard about Hewlett-Packard (HP) and Fairchild Camera and Instruments locating facilities in this state. The Economic Development Department worked hard to bring those and other businesses to the State.

> ''Washington State could be one of the top 2 or 3 states for electronics firms. . .''

In March of this year, Hewlett-Packard called the Department and said that their two-year long battle to get land re-zoned and developed near Lake Stevens from a rural designation had suffered a blow with the preliminary hearing examiner's rejection of the draft re-zone plan. After two years of planning and millions of dollars invested, they said, ''That's it. We are going to pull out.'' They had never been faced with such resistance.

The Fairchild project in Pierce County had problems as well but mostly involving mitigating the impact of the plant on public services, water, sewer and roads near the plant. There was considerable doubt that the local communities could handle the size of development and the problems that came with it simply due to lack of public resources.

The problems were presented to the Governor. The State needed to allocate sufficient financial resources in order to mitigate some of the problems and to answer some of the questions of the counties. The Governor agreed to listen to Hewlett-Packard and get from them a commitment as to how many people they were going to employ from the State as opposed to bringing in people from elsewhere.

From there, the Governor presented some solutions to the Legislature so they could make a commitment of funds so the questions raised by the hearing examiner could be answered. The Governor was asking for a measure to be passed by the Legislature to allocate sufficient funds to mitigate the impacts of growth. Within ten days after HP had called, the Legislature had passed a resolution through both houses allocating the necessary funds. That was an extraordinary action. The Legislature is not accustomed to acting that quickly and with such cooperation from all parts of the State. With that allocation, it was possible to go to the hearing examiner and make a better proposal. Three weeks later, he made a final approval of the plan.

With this kind of activity, the State made a strong committment to attract the electronics industry. It made commitments to both H-P and Fairchild in the form of additional assistance to local governments through funds via various state agencies. Major allocations of state resources, millions of dollars, have been put forward to enable these two leading firms to locate here.

There is a perception by the Spellman administration that high technology industry, particularly microelectronics, is a very highly desirable industry for this state. The estimated tax return on investment is about 14 to 1. Local governments will benefit the most through increased property taxes and the State benefits with payroll taxes and Business and Occupation taxes. It fits in with much of the industry that is already here; it fits nicely with the environment. Our labor force is appropriate and the kinds of educational institutions that we have here are compatible. It is an industry that has a huge growth potential. Industries we have relied on in the past, some of the major ones like lumber, have a less than rosy future in terms of growth. There is a need for diversification. We will not only see more major electronics firms like H-P and Fairchild but perhaps some smaller firms thoughout King County and elsewhere.

Washington State could be one of the top 2 or 3 states for electronics firms. We could be number one in the number of electronics firms from the far east who locate here. There is a great deal of interest by developed Pacific Rim countries like Japan, Korea, and Taiwan. The Department of Economic Development was negotiating while the Governor was on the trade mission in June and it prepared for technical trade missions later.

We are pursuing what we call reverse investment. We see no difference between ownership of a plant, foreign or domestic so long as they employ Washington State residents. We are actively pursuing capital investments.

For example, SEH America, which had its U.S. headquarters in San Jose, has moved to Vancouver. It is an expanding firm, a leader in the field of microprocessors. One of their principle reasons for moving into our state was the price of energy. Although we are concerned with

1981 Personal Computer Fair

WELCOME to the 1981 Personal Computer Fair! It's the biggest we've ever had—and the best. We have more of everything: More computers; More speakers; More movies; More special events; More fun!

The Seattle Personal Computer Fair is unique in the country. It is the only computer exhibition aimed towards the general public. It doesn't matter if you don't know a byte from a CPU, this is the place to start. On the other hand, if you know computers inside out and upside down, we'll show you what others are up to. We have something for everyone.

> ''Be sure to check out our special events. . .''

Be sure to check out our special events. The computer chess tournament will be going on continuously; watch computers battle each other under official tournament rules. Or pit yourself against the various machines; see how you rank!

We're very proud to be showing two special movies this year. In addition to our entertaining and educational shorts, we're featuring computers in two famous and well acclaimed films. Saturday at noon we'll be screening *2001: A Space Odessey*, and Sunday, also at noon, *The Forbin Project*. Can computers get out of control like that? Sometimes it feels that way when you're losing at Space Invaders.

> ''Don't forget to stop by the Northwest Computer Society's booth. . .''

We've put together a very special program of speakers during the fair. We have representatives from many of the major computer manufacturers and distributers. They'll be talking, and showing video tapes and slides, about many subjects. The talks range from an introduction to computers to advanced technical workshops on the new 16-bit microprocessors.

Visit our Hardware Room. Watch a computer being built—and lend a hand doing it. This is the place to learn how a computer works, from the inside out. Be sure to ask lots of questions.

Or perhaps it's programs you're interested in. Come to the Software Swap. We've gathered together the user's libraries of all the popular machines. These are all programs available to the public for free. Literally thousands of them; for Apple, Pet, Heath, and CPM. We'll be copying them onto discs; bring one down or buy one there. And be sure to bring down your own programs; we'll distribute them to the public. It's a chance to become famous!

Be sure to poke your head into all the commercial booths here. Almost all the stores in town are represented. Between them you can see all the latest hardware and software. . .and get to try it out.

But the best part of the show is the hobbyist booths. We're showing you what people are doing with computers. At home, in the office, at school. Be sure to try out all the programs. Look at the graphics, listen to the music, play the games, try your hand at word processing. The fair is here for you to use; so are the computers.

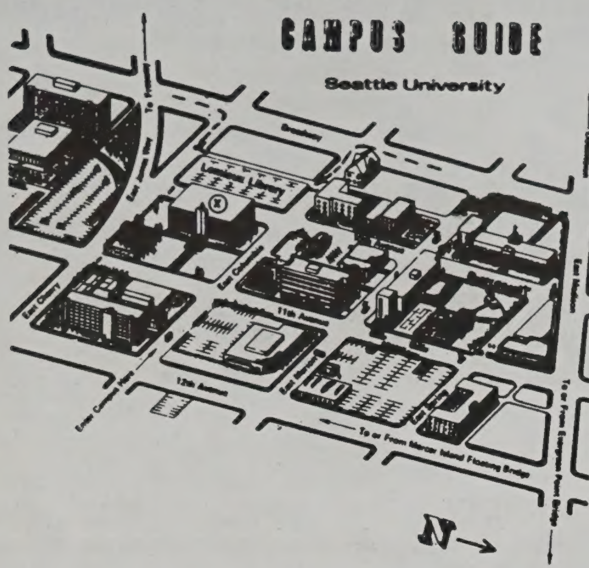
Don't forget to stop by the Northwest Computer Society's booth and join up. For $10 a year you get this newsletter, interesting meetings, low-cost time-sharing, group purchases, and many other benefits.

The 1981 Personal Computer Fair—We're here because you are!

Ken Berkun, Fair Chairman

Northwest Computer Society
P.O. Box 4193
Seattle, WA 98104

Bulk Rate
US Postage
PAID
Seattle, WA 98134
Permit # 2924


CAMPUS GUIDE
Seattle University
Broadway
11th Avenue
12th Avenue
East Madison
To or From Mercer Island Floating Bridge
To or From Evergreen Point Bridge
N

MEETINGS

SEATTLE—The Society meets at Seattle University. Seattle University is on 12th Avenue, between E. Madison St. and E. Cherry St. Meetings are held the first and third Thursdays of each month at 7:30 PM. The first meeting of the month usually features a formal presentation by a speaker or speakers. The second meeting is usually more informal with freewheeling discussion and problem solving.

Meetings are held in the Lemieux Library Auditorium, room 115, on the Seattle University campus.

Saturday & Sunday, November 14 & 15
1981 Personal Computer Fair at the Pacific Science Center, Seattle Center.

Thursday, November 19
Informal meeting with no speaker scheduled.

Thursday, December 3
"Getting Started In Personal Computers;" a panel discussion.

Thursday, December 17
Informal meeting with no speaker scheduled.

This schedule has a potential for alteration. We'll try to keep you informed of any changes.

MEMBERSHIP

Membership in The Northwest Computer Society and attendance at meetings are open to anyone interested in personal and small business computers. Subscription to *Northwest Computer News* is $10.00 per year. All memberships expire at the end of the year — that means December. All memberships are renewable at the beginning of the year — that means January. In the past we have had an informal policy of pro-rated dues at midyear.

THE NORTHWEST COMPUTER NEWS

This paper is produced monthly by The Northwest Computer Society. It is a benefit of membership in the Society. Other clubs who issue newsletters are encouraged to exchange copy.

THE 1981 NORTHWEST COMPUTER NEWS STAFF:
Editor: Llyle Morgan 447-1663
Associate Editor: Bob Woodbury 271-5593
Circulation: Open
Sales Director: Llyle Morgan 447-1663
Editorial Board: Joe Felsenstein, Ken Berkun, Bill Hunter, Daily McHugher

COPYRIGHT
Any content that is specifically marked "COPYRIGHT", "c", or © may not be reproduced without the written permission of the author. All other content copyright© The Northwest Computer Society, but may be reproduced for non-commercial purposes provided that the author and *Northwest Computer News* are given credit.

ADVERTISING
Relevant commercial advertising is encouraged in NCN. Ads will keep the membership informed of new products, services and opportunities as they appear in the marketplace. Current rates (REVISED AUGUST 1980) are as follows:

DISPLAY ADVERTISING RATES

Size	Cost	
Full Page (48")	$110.00	
⅔ Page (32")	90.00	
½ Page (24")	60.00	
⅓ Page (16")	50.00	
¼ Page (12")	35.00	
Business Card (NWCS Members only)	20.00	per 6 insertions
Column Inch	12.00	
Inserts	150.00	plus printing to post office requirements.

5% discount for 3-5 insertions per year, paid in advance.
10% discount for 6-12 insertions per year, paid in advance.

MECHANICAL REQUIREMENTS
Columns to page: 3.
Column depth: 15.25".
Column width: 3".
Full page image area: 9.75" X 15.5".
Reproduction proof or negative preferred. Camera-ready art acceptable. Minimum space order: 1 column inch. Special requirements: rates on request.

CIRCULATION
Equally by subscription ($10/yr.) and news stand sales ($1.00/copy).

CREDIT TERMS
Payment must accompany orders for new advertising. No cash discount is offered.

1981 SOCIETY OFFICERS

President: Joe Felsenstein 365-3829
Vice President: Llyle Morgan 447-1663
Secretary: Rick Powers 328-0591
Treasurer: Tom Philbrick
Program Chairman: Ken Berkun 524-7260
Board Member: Randyl Britten 522-1736
Board Member: John Marshall 854-9244

BOARD MEETINGS

Board members—There will be monthly board meetings the third Thursday of each month at 6:00 pm. The next board meeting will be July 16 at Block's Restaurant in Seattle.

EDITOR'S NOTE

WANTED-The Newspaper staff could use a few more volunteers:
(1) A photographer is needed to take pictures at the meetings, special events such as the computer fair and "My Systems" articles. Film will be reimbursed.
(2) Cartoonist/graphics etc. is needed.
(3) And volunteers to enter articles onto Nordata, you must have a crt/printer and a modem.

SPECIAL ISSUE 1981

VOLUME 6, NUMBER 10

RECORDED MESSAGE

527-1852

NORTHWEST AREA COMPUTER STORES

SEATTLE - NORTH

Magnolia Microsystems
2264 - 15th W
Seattle, WA. 98119
285-7266

Micro Business Systems
6401 Roosevelt Way NE
Seattle, WA. 98115
324-9972

Omega Computers
1032 NE 65th St.
Seattle, WA. 98115
522-0220

Radio Shack
18405 Aurora Ave. N
Seattle, WA. 98133
542-6184

SEATTLE - CENTRAL

Byte Shop
2605 - 2nd Ave.
Seattle, WA. 98121
622-7196

Pro Audio Seattle
11057 - 8th Ave. NE
Seattle, WA.
367-6800

Heathkit Electronics Center
505 - 8th Ave. N
Seattle, WA. 98109
682-2172

United Products, Inc.
2300 - 1st Ave.
Seattle, WA.
682-5025

Puter Parts
1331 - 3rd Ave.
Seattle, WA.
625-9556

SEATTLE - SOUTH

Amateur Radio Supply
6213 - 13th Ave. S
Seattle, WA. 98108
767-3222

Empire Electronics
616 SW 152nd
Seattle, WA. 98166
244-5200

Heathkit Electronic Center
15439 - 53rd Ave. S
Tukwila, WA. 98188
246-5357

Radio Shack Computer Center
15425 - 53rd Ave. S
Tukwila, WA. 98188
248-3710

Computerland
Sunset Plaza Shopping Center
3200 NE Sunset Blvd.
Renton, WA. 98055
271-8585

FEDERAL WAY

Computerland
1500 S 336th St./Pkwy. Center
Federal Way, WA. 98003
838-9363

LYNNWOOD

Omega Computers
5421 - 196th Ave. SW
Lynnwood, WA. 98036
775-7585

BELLEVUE

Almac/Stroum
14360 SE Eastgate Way
Bellevue, WA.
643-4044

Central Computers
Factoria Square
3836 - 124th Ave. SE
Bellevue, WA. 98006
746-5227

Computerland
14300 NE 20th St.
Bellevue, WA. 98007
746-2070

Omega Computers
839 - 106th Ave. NE
Bellevue, WA. 98004
455-1138

OUTSIDE SEATTLE

Computer Products Div.
10316 Highway 99 S
Everett, WA. 98204
355-1951 or 743-2295

The Computer Connection
3100 NW Bucklin Hill Road
POB 1194
Silverdale, WA. 98383
692-7753

Yakima Computer Store
1509 Tieton Dr.
Yakima, WA. 98902
453-7378 or 248-9040

Computerland
8791 S Tacoma Way
Tacoma, WA. 98499
581-0388

Micropi
2445 Nugent
Lummi Island, WA. 98262
758-2286

Computers Plus
1415 W Meeker
Kent, WA. 98031
854-7629

Smart Box Shop
110 N Tower
Centralia, WA. 98531
(206) 736-4048

If you know of any other Northwest area computer stores, let us know and we will include them in this list in future issues.

Discounts

DISCOUNTS are offered to Northwest Computer Society members at the following computer outlets:

Almac/Stroum
14360 SE Eastgate Way
Bellevue, WA.
643-4044

Discounts offered: 10% off parts or tools, 15% off books and literature, $30/10 for disks with plastic file box.

N. C. Data
1504-3rd Ave., Suite 700
Seattle, WA.
622-2719 or 622-4220

Discounts offered: 10% to 20% off list price on purchases over $100 of Radio Shack computer catalogue items. Other product lines discounted as well. Inquire for prices. □

How It's Done

THE *Northwest Computer News* is typeset using a Compugraphic Editwriter 7500 photo-typesetter equipped with an Intelligent Communications Interface (ICI). The ICI allows us to typeset text which has been stored on the Nordate timesharing system and other computer systems.

Our writers use terminals at home or at work to keyboard their articles into Nordata. Our editor can look at those files on a home terminal and make needed changes. When the articles are ready, they are transmitted by phone to Compugraphics's Editwriter.

The typeface we are using is English Times. Some copy is received in camera-ready form from other sources so other typefaces may appear occasionally. Advertisements, in particular, are received in camera-ready form.

The Northwest Computer Society expresses its appreciation for the use of Compugraphic's equipment. □

MEMBERSHIP/SUBSCRIPTION APPLICATION:

NAME ____________________
STREET ____________________
CITY ____________________ STATE __________ ZIP __________
PHONE ____________________ HAM CALL __________

What computer do you own/use? ____________________
What operating system/software? ____________________
What applications do you want to implement? ____________________
How can we help you? ____________________
How can you help us? ____________________

(Membership dues are $10.00 per year.)

Membership thru Dec. 19______: $__________ ☐ New Subscription
Ck/M.O. No.________ ☐ Renewal

Subscription is free to the following organizations subject to acceptance by the NWCS:
Name of Product, Pub. or Newsletter ____________________
☐ Club Exchange
☐ Computer Store in Area
☐ Major Mfr.
☐ Supplier
☐ Publisher

Northwest Computer Society
P.O. Box 4193
Seattle, WA 98104

Calendar

November 14-15, **1981 Personal Computer Fair.** Pacific Science Center. $3.00 for adults, $2.00 for children.

November 16, **Boeing Employees Computing Club.** Regular meeting. Topic: Computer Security. Also, electronics night and elections. Boeing Plant 2 Cafeteria, 14th and E Marginal Way, 7:30 pm. Contact Mark Morris, 241-3823.

November 16-17, **Data Processing and Office Automation: Technology and Management.** Seminar, presented by Battelle Institute. For more information, contact Registrar, 4000 NE 41st St., Seattle, WA. 98105.

November 17, **Personal Programmable Calculator Club.** Regular meeting, topic to be announced. H-P offices, 15815 SE 37th St. Contact Bob Moore, 534-7879.

November 18, **TRS-80 Users Group.** Regular meeting. 7:30 pm. Burien Public Library, 14700 6th Ave. S. Contact Steve Smith, 271-5924.

November 18, **Women Business Owners.** Regular Meeting. "De-mystifying Computers." Speaker: Llyle Morgan. 11:30 am. The Meeting Place at the Pike Place Market. For information and reservations, contact Marsha Tellsbo.

November 18, **Northstar Business Club.** Regular Meeting. Contact Dave Keeney, 345-5585.

November 18, **Association for Systems Management.** Regular Meeting. Speaker Denny Brown. Topic: "When and How to Work with Contractors." Social Hour, 5:30 pm, Camlin Hotel. Dinner $12.00. For information and reservations, contact Ray Magill, 624-9000.

November 19, **Northwest Computer Society.** Informal meeting, no speaker scheduled. 7:30 pm, Seattle University Library Auditorium. Contact Ken Berkun, 527-1852.

* * *

November 18-19, **ACM National Lecture.** "How to Become Professionally Certified." Lecturer: James Ketchel, an expert in the field of certification for Data Processing Professionals. Nov. 18, 8:00 pm, Seattle University Library Auditorium and Nov. 19, 11:30 am, Royal Fork Restaurant, 18188 E 4th, Olympia, WA.

November 19, **DPMA Puget Sound and Evergreen Chapters.** Joint meeting. Speaker: Joe Dilworth on "How to Run a Data Center for Fun and Profit." 7:00 pm at the Landmark Inn. Cost $10.00. Reservations by Nov. 17 to Jana Jones, 362-0926.

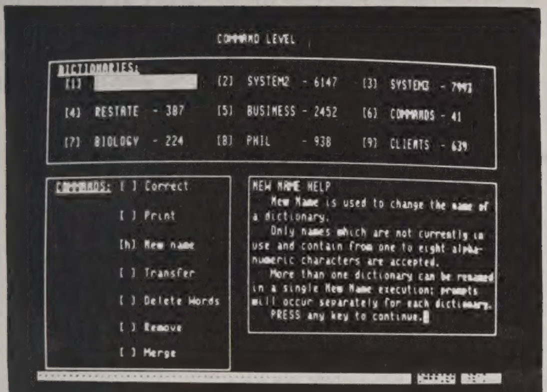
November 25, **CP/M-Pascal.** Regular meeting, KOMO-TV Studio G, 7:00 pm. Contact Dick Curtiss, 784-8018.

November 28, **Atari Users Group.** Regular meeting, Kent Video and Computers, 6:30 pm. Contact Oscar Hasten, 622-7196.

November 30, **Northwest Association of Cromemco Users.** Regular meeting. Contact Jim Illman, 932-8771.

CORRECTOR™
a spelling correction system

performs the actual correction of a document under user control ■ no need to return to an editor ■ very fast total correction time



```
COMMAND LEVEL
DICTIONARIES:
[1]                    [2] SYSTEM2  - 6147    [3] SYSTEM3 - [illegible]
[4] RESTATE  - 387     [5] BUSINESS - 2452    [6] COMMANDS - 41
[7] BIOLOGY  - 224     [8] PHIL     - 938     [9] CLIENTS - 639

COMMANDS: [ ] Correct        NEW NAME HELP
          [ ] Print             New Name is used to change the name of
          [h] New name       a dictionary.
          [ ] Transfer          Only names which are not currently in
          [ ] Delete Words   use and contain from one to eight alpha-
          [ ] Remove         numeric characters are accepted.
          [ ] Merge             More than one dictionary can be renamed
                             in a single New Name execution; prompts
                             will occur separately for each dictionary.
                                PRESS any key to continue.
```

■ simple editing features

■ correction in context of a five-line window into the document

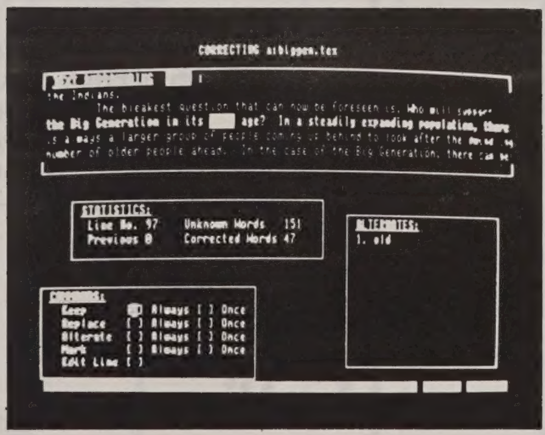
■ unknown words analyzed to determine the correct spelling

■ 20,000 word dictionary

■ on-line help for all commands

■ check text with up to nine dictionaries

■ complete set of commands to maintain dictionaries



```
CORRECTING a:biggen.tex
the Indians.
      The bleakest question that can now be foreseen is, Who will support
the Big Generation in its      age?  In a steadily expanding population, there
is always a larger group of people coming up behind to look after the [illegible]
number of older people ahead.  In the case of the Big Generation, there can be

STATISTICS:
 Line No. 97     Unknown Words   151        ALTERNATES:
 Previous 0      Corrected Words 47         1. old

COMMANDS:
 Keep       [ ] Always [ ] Once
 Replace    [ ] Always [ ] Once
 Alternate  [ ] Always [ ] Once
 Mark       [ ] Always [ ] Once
 Edit Line  [ ]
```

requires 48k, Z-80*, CPM**, 2 100k or more drives, and a cursor-addressable video terminal

written in Pascal/Z***, and Z-80 assembly language

works with most word processors

$69 from SYBORG
P.O. Box 6891 Bellevue, WA 98007
(206) 643-2890 Visa and MasterCharge accepted

*Zilog, **Digital Research, ***Ithaca Intersystems

Flea Market

FLEA MARKET is a service provided by NCN and is free to non-commercial members. A nominal charge of $.50 per line is levied on all others. All ads should be sent to: NWCS, POB 4193, Seattle, WA 98104.

FOR SALE:
Mits (Pertec) 8800b mainframe, dual double density Shugart SA-400 floppy disk drives, 38K of static RAM, quad parallel port, triple serial port, Heathkit H-19 smart terminal and H-14 smart printer, CP/M 2.0, Northstar V5.0 DOS-BASIC-monitor—all integrated, and documentation. (206) 776-6124 for information.

FOR SALE:
Chips—prime 4116-type DRAMS guaranteed to work in any computer, $20/8. Most Z-80 components also available. Call (208) 664-6737 or write to Trans-M Co., 516 Mill Ave., Coeur d'Alene, ID 83814. Evenings best.

FOR SALE:
LA-36 Decwriter II, 4 yrs. old. $700 or best offer. Work: 455-8080, Home: 483-6084. Ask for Lyle or leave message.

FOR SALE:
Digital Research Big Board: 64K Z-80 with monitor, 80 x 24 character generator, 8" floppy disk controller, CP/M boot, 2SIO, 2PIO, RTC, bare board—$199, basic kit—$600. All that is needed to be up and running is an ASCII keyboard and monitor. Integrand enclosures, highest in quality/lowest in cost, from $200. S-100 mother boards, power supplies, disk cut-outs (8" and 5¼"). General computer peripherals and parts, all IC's usually in stock. Monolithic capacitors, 0.1 mf 25/$7.50m 0.01 mf 25/$6.00. Cables, connectors, new and used S-100 boards bare, kit, A&T. Books and documentation for perusal—over 500 different books and dox. Computers: Northstar, Cromemco, Ithaca Intersystems, Commodore. CMPUG software on a Morrow hard disk—purchase disks and fill 'em up!!!

FOR SALE:
48K Zenith micro with CP/M, MBASIC, make offer, 747-7402.

FOR SALE OR TRADE:
Radio Shack Videotex terminal. The terminal has a 6809 and terminal program in ROM; it has a built-in direct-connect modem. $280. Joe Duncan, 632-6194

FOR SALE:
Microsoft COBOL-80 System. Includes: COBOL-80 compiler, MACRO-80 assembler, LINK-80 loader, CREF-80 cross reference facility, LIB-80 library manager, and complete documentation. Available for CP/M on an 8" IBM format floppy disk. Asking $500.00. Call Dick Gentry at 747-9901.

FOR SALE:
Northstar Parts (from bankruptcy purchases)—too numerous to list. Call or write for details. Wayne Walcott, AMI, 1404-140th Place NE, Bellevue, WA 98007. (206) 643-2050.

FOR SALE:
Z80/64K S-100 Bus; Hazeltine 1500 Terminal; CDC 32-Megabyte Cartridge Module Drive; Triple 8" Floppy Drive. Runs CP/M with hard disk boot; CP/M provided. Best offer over $11,500. For information, please call Mr. Peterson at 827-1119 during business hours.

FOR SALE:
IBM 2741 teletypewriter. Operable condition; no documentation. $350 or offer. Call Mr. Peterson at 827-1119.

The club receives a large amount of advertising mail that cannot be accommodated in the paper. Therefore, what does not get printed is brought to the meetings and distributed. There are special interest programs and hardware that may be of interest. You are invited to browse through it. □

Confutation

by Joe Felsenstein

= =

BDS C—Yet another rave review

= =

If you have been reading Byte or Microsystems, you have lately been hearing them say very nice things about a compiler called BDS C. It was produced by Leor Zolman, and is a compiler for a subset of the C language. More about C in a moment. When I heard more rave reviews of BDS C from a local Northstar user, Dan Cosgrove, and a visiting academic, Andy Siegel of Princeton, NJ, I decided that maybe I should get it. So I did. And this is another rave review.

BDS C costs $150 (plus maybe $3 more in mailing costs) from Lifeboat, who is BDS's official distributor. It is a compiler for the 8080 running under CP/M. The first two things that struck me were 1) that the compiler was very fast, and 2) that the manual was very entertaining. The speed is really nice. A program of about 100 lines (excluding comments) compiles in two passes, each of about 15 seconds on my 2 MHz 8080. The separate link phase took another 15 seconds. This means that after about 45 seconds you're ready to try out the program and watch it blow up. Then back to the editor and then the compiler to fix it. The speed makes this process almost as convenient as with an interpreter like MBASIC.

The manual is a gas. With the compiler comes 'The C Programming Language' by Brian Kernighan and Dennis Ritchie, which is a competently done introduction to C. Along with that, Leor Zolman's own document for the BDS version. Zolman must be a very funny fellow, for his document is fun reading. He starts out with a pitch concerning the price of BDS C, and why you shouldn't steal it. He is very convincing: BDS C is deliberately priced low, and that should be rewarded.

Even the error messages can be witty: when I gave the compiler the wrong file name, it came up with the usual sort of message: 'Unable to open file: JUNK.C,' but when I forgot to give it any file name at all, it came up with 'What exactly did you want me to compile?'

Well, you aren't going to consider buying BDS C for the entertainment. Why should you consider it, and why should you not consider it? It is a compiler, it is fast, and it compiles a structured language. If you want to make system utilities for yourself, it makes nice small programs that run fast. Because C is a structured language, the programs are easy to read and modify. For the purists, I should mention that C isn't really as fully structured as Pascal: you can't declare procedures inside of procedures, and variable declarations like 'int x' above hold until the end of the procedure or function and not just until the end of the block. Still, it doesn't require GOTOs and statement numbers, and that is what counts.

> "In fairness, I should mention that there are even cheaper 'Small C' compilers..."

On the other hand, BDS C is not a full subset of the C language. and C is a somewhat cryptic language in the first place. BDS C does not have any real arithmetic (except by calling rather obscure and difficult functions). So it is no good for number crunching. On the other hand, Zolman provides a number of library routines for reading and writing files, deleting and renaming files, calling the CP/M BDOS, and PEEKing and POKEing. This makes it easy to write utilities using BDS C.

The C language is like Pascal. It differs mostly in a lot of details which make it less readable. For example, a program chunk to look through an array of integers and find the position and size of the smallest one looks like this:

```
int a[100], i, j, smallest;

j = 1;
smallest = a[1];
for (i = 2; i <= 100; i++)
   if (a[i] < smallest) {
      j = i;
      smallest = a[i];
      }
```

while a Pascal program chunk to do the same thing looks like:

```
var a : array[1..100] of integer;
    i, j, smallest : integer;
begin
   j := 1;
   smallest := a[1];
   for i := 2 to 100 do
      if a[i] < smallest
      then begin
         j := i;
         smallest := a[i];
         end;
end;
```

The immediate thing you notice about the two languages is that: 1) they are basically similar—you can almost translate from one to the other statement-for-statement, and 2) Pascal uses words where C tends to use symbols. The result is that C is more concise and less readable. Pascal is wordier and more comprehensible: if you try you can almost make it look like English. Pascal is also widely spread. If you write a program in it and are careful, it can easily be made to run on many different machines.

C is not really well standardized, and not that widely available. If you write a CP/M utility in it, what you must depend on is the standard nature of CP/M. People will be able to execute your compiled object code, even though they don't have a C compiler at all. A force favoring C is the coming use of Unix as the standard operating system on the 16-bit 8086 and 68000 (and Z8000?) machines which will dominate the next decade. The source code for Unix and its utilities is in C, and all Unix systems necessarily have C compilers. But they also have Pascal compilers.

On the whole, you should think of using C if you think you have the time and energy to learn C, and can use it to produce useful utilities which will run under CP/M. A particularly attractive feature is the lack of any royalty or permission requirement when you sell or distribute compiled programs (the public-spirited Zolman begs you to distribute source code too).

The conciseness of C is the flip side of its slight obscurity. In the above example, the expression i+ + means to use the variable i, and afterwards increment it by one. If instead I had written + +i it would mean that i is incremented and then used. You can also do assigments to a variable in the middle of other things: 'x[i+ =2] = 3' means to increment i by 2 and then assign 3 to the element of array x which is indexed by this new value of i. There are all sorts of operators to do bit-twiddling: "and" shift integers, & does a bitwise masking operation, and so on.

A particular difference between C and Pascal is their attitude toward types. In Pascal you cannot mix (say) integer and character types with impunity—you cannot just ask whether x = c if x is an integer and c a character. In C the attitude is the opposite: go ahead, we'll trust you not to screw up. So you can ask whether x = = c. In Pascal you are better-guarded against making blunders, but this is at the cost of having to write extra code: you would have to ask whether x = ORD(c), and so on. In C you can assign and compare almost anything, which means the door is open both to concise code and to horrible blunders.

> "It is a compiler, it is fast, and it compiles a structured language..."

I am going to use C to write the distributed version of my Configurable Terminal Program (in fact, it's almost done). If you need a systems programming tool and are willing to make the investment of time to read Kernighan and Ritchie, I would strongly recommend BDS C. If not, not.

In fairness, I should mention that there are even cheaper 'Small C' (as little as $15) compilers, as well as the large, expensive, but quite functional Whitesmiths C (about $700). You might want to consult the articles by Christopher Kern in the June 1981 *Byte* and David Fiedler in the Sept/Oct 1981 *Microsystems* (that's Sol Libes' old *S-100 Microsystems* renamed). Both give lots more information. There is apparently a BDS C Users Group formed which will distribute public domain software. The address is in the *Microsystems* article. ☐

680X Directory.

A Directory of 680X products, both hardware and software (for the SS-50 bus) is available from T. K. (Tom) Boyd, Belmont School, Feldemore, Holmbury St. Mary, Dorking, Surrey, RH5 6LQ, England. Be sure to send a SASE and a donation to cover copying/reproduction costs. Information is added to the directory as enough becomes available to fill an additional page. The directory thrives on bits of information sent in by readers, so if you know of some interesting details on SS-50/680X products, send them along.

united products, inc.

2300 First Avenue
Seattle, WA 98121
(206) 682-5025

"Serving all our customers' electronics needs."

Plenty of **FREE** parking in the lot north of the building.

HOURS: Monday - Friday: 9:00 a.m. to 6:00 p.m.
Saturday: 9:00 a.m. to 5:00 p.m.
Closed Sundays and Holidays

FLOPPY DISC DRIVES

86^00 EA. !

MODEL 6106

BASF

DUAL/SINGLE DENSITY
40 TRACK
12 MS ACCESS TIME

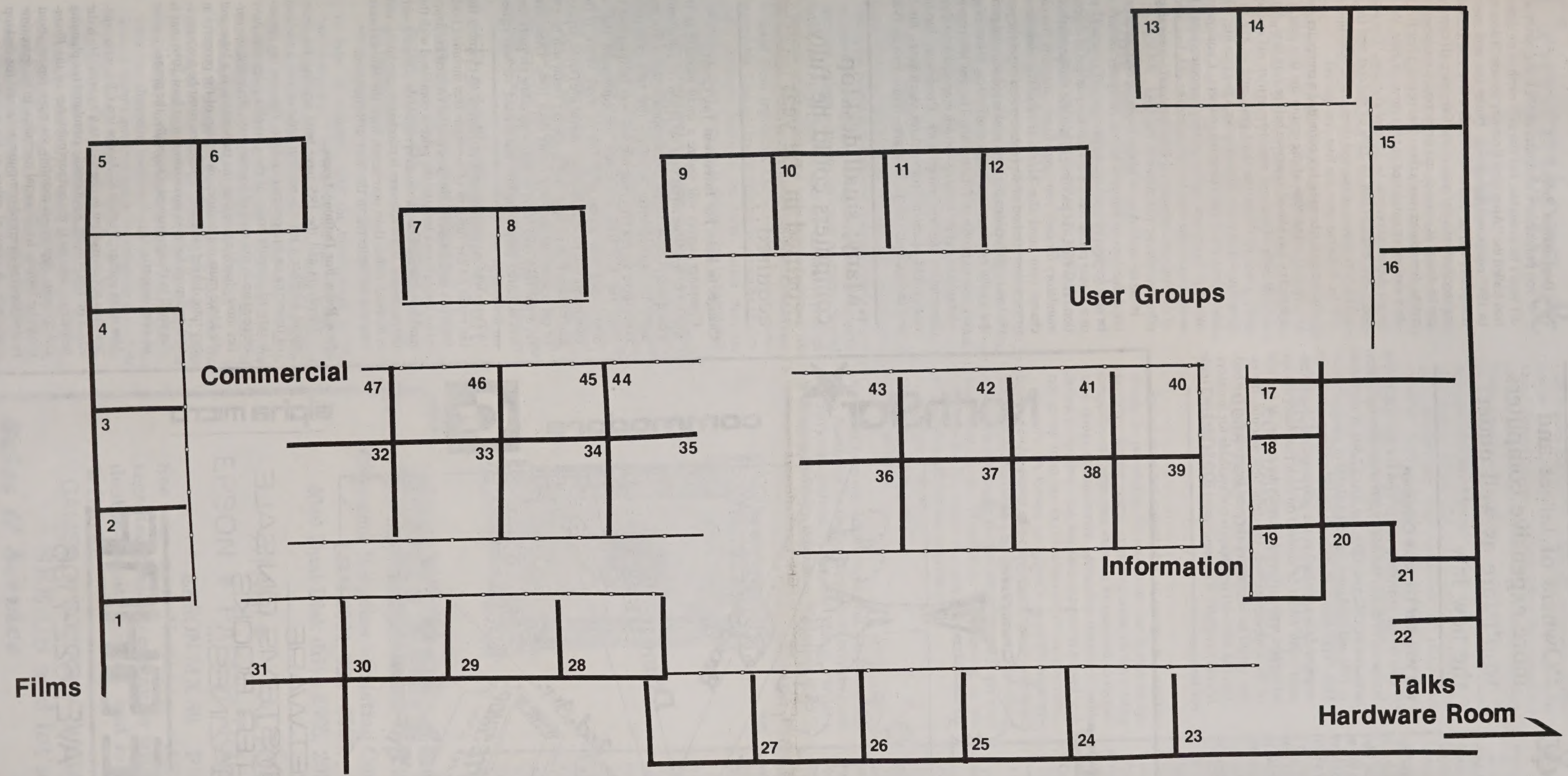
Shugart Compatible / User Defineable Hard / Soft Sectored

TRADE-INS OUT OF BANK BOOKKEEPING SYSTEMS

Keyboards / CPU's / Power Supplies / Monitors / Tools / Batteries / Displays / L.E.D. and L.C.D. Watch Movements / Soldering Supplies Surplus / P.C. Cards / Memory Chips / Transistors / Diodes / Transformers / Tally Data Scribes / Teletype Paper / Modems Interface Chips / TTL / Low Power Schottky / Wire Wrap Tools And Accessories / Linear Devices / Terminal Blocks / Capacitors Crystals / Cabinets / Line Cords / Wire And Cable / IBM Card Sorter / Gears / Pulleys / Watches / Calculators / Fuses / Surplus Sockets / Connectors / Keytop Engraving / Floppy Disc Drives / Computer Grade Caps / Mylar Capacitors / Spray Paint Surplus Test Gear / Switches / Flat Cable / Hardware / L.E.D.'s / NE-2's / 2111's / Vises / Seven Segment Displays Paper Tape Accessories / Motors / Odds-And-Ends / Surplus.

UNITED PRODUCTS, INC. HAS THE LARGEST "STATE-OF-THE-ART" ELECTRONICS SURPLUS DIVISION IN WASHINGTON.

UNITED PRODUCTS WELCOMES YOU TO THE NORTHWEST COMPUTER FAIR



Commercial

1. Radio Shack
2. Radio Shack
3. Computerland
4. Computerland
5. Micropi
6. Wyle
7. Byte
8. Byte
28. Texas Instruments
29. The Software Store
30. The Electronics Store
31. Almac/Stroum
32. Magnolia Microsystems
33. HCS
34. Central Computers
35. Omega
36. Heathkit
43. Heathkit
44. Omega
45. Software Unlimited
46. Mediaware
47. Magnolia Microsystems

User Groups

9. Telidon
10. N.W. Pet Users Group
11. N.W. Pet Users Group
12. Oregon Commodore Users Group
13. 68XX Users Group
14. Boeing Employee's Computing Club
15. TRS-80 Users
15. Seacom-80.
16. Bellingham Users Group
17. Northstar Business Club
18. Teach Yourself Basic
19. Software Swap
20. Northwest Computer Society
21. Northwest Computer Society
22. Northwest Computer Society
37. Northwest Computer Society
38. Norhtwest Computer Sociaty
39. N.W. Computer Society Welcome Booth—Information
40. Atari Users Group
41. A.P.P.L.E.
42. A.P.P.L.E.

Educational

23. Interlake High School
24. Icthus School

Professional

25. Puget Sound Association for Women in Computing
26. Puget Sound Association for Computing Machinery
27. University of Washington Computer Information Center

Computers & Taxes

© 1981, Vernon K. Jacobs

SHOULD you buy your first (or next) computer this year or next? Should you lease or buy? Are there any other areas of the new tax law that might affect those who own or are thinking of owning a computer? There are at least 109 specific provisions in the "Economic Recovery Tax Act of 1981," and it will be months (perhaps years) before the impact of all the provisions is evaluated. It's almost certain that we will have another tax bill early next year to correct the inevitable technical errors and flaws in this hastily drafted and complex set of tax law changes. Nonetheless, here is a brief summary of some of the provisions of the new tax law that should be of specific concern to computer owners and lessees.

> "Owners of larger and more expensive computers won't fare as well under the new law..."

Full Write-Off For Small Computers.

One of the provisions of the new tax law will permit businesses to deduct the first $5,000 of business equipment acquired in 1982 and 1983, the first $7,500 of purchases in 1984 and 1985, and the first $10,000 of purchases after 1985. This means that many small desktop computers could be fully expensed in the year acquired. No investment credit would be allowed on such purchases but the immediate write-off would usually be better. If the cost of the computer exceeds the deductible amount, the excess would be eligible for the new depreciation method. This full write-off provision is not available for investors. It's only available if the equipment is to be used in a trade or business.

New Depreciation Rules.

If you purchased a computer in 1981, the 100% write-off won't be available, but the new method of depreciation (called the "Asset Cost Recovery System") does apply to 1981 equipment purchased. Under the new method, computers will be depreciated over a five year period using specified rates for each of the five years. (If computers can be classed as research and development equipment they can be depreciated over a three year period.) For five year class equipment purchased in 1981 through 1984, the first year's depreciation will be 15% of the cost. The second year's depreciation will be 22% of the cost and the rate will be 21% in each of the next three years. The entire cost will be deducted over the five year period.

By contrast, the prior law permitted a computer owner to write off up to 40% of the cost in the first year if the equipment was placed in service before July first. An additional 24% of the cost would be written off in the second year, 14.4% in the third year, and 10.8% in the fourth and fifth years. This assumes a five year life, which has been typical for computer owners. Consequently, owners of larger and more expensive computers won't fare as well under the new law as under the old, but owners of desktop size computers will be better off—assuming no other equipment purchases in the year.

If the tax deductions won't be available because of other tax deductions or business losses, computer owners will be able to elect to write the equipment off over a 12 year or a 25 year period using a straight line method of depreciation. However, the election to use the slower method is mandatory for each year's purchases—meaning you can't change your mind after a year or two. The main reason to use a slow method of depreciation is to avoid the possible loss of deductions during a prolonged start-up period due to the existing time limit on offsetting losses of one year against profits of future years. The new law provides substantial relief in this area—which may make the slower depreciation method unnecessary. Previously, business losses could be carried forward for seven years, but the new law extends this to 15 years—retroactive to 1976.

> "Many; small desktop computers could be fully expensed in the year acquired..."

Changes In Rules For Investment Tax Credit.

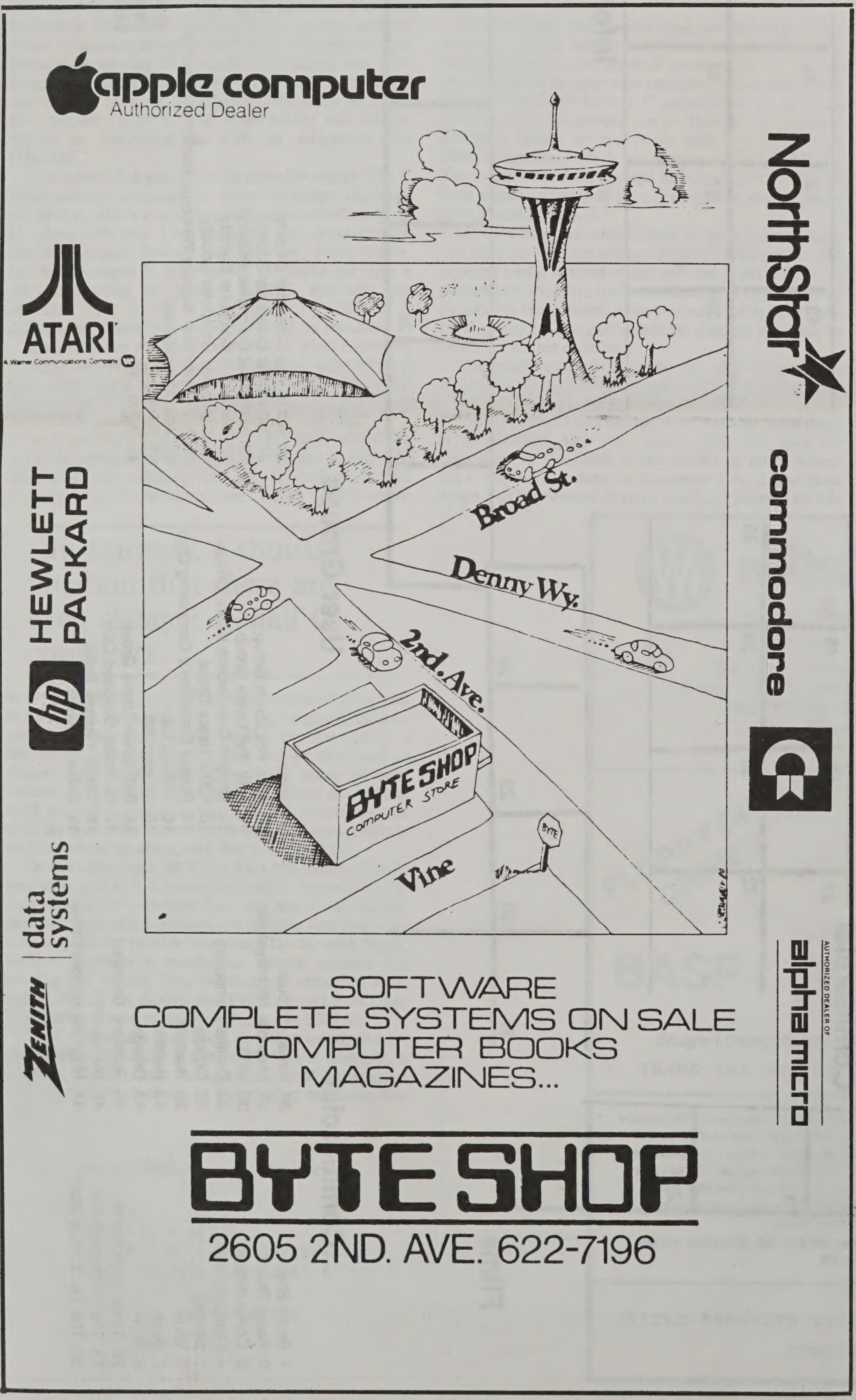
Computer buyers will realize a small increase in the amount of available investment tax credit for purchasing a computer. Under current law, equipment with a five year useful life is eligible for ⅔ of the full 10% tax credit. Equipment with a five year life will now be qualified to claim the full 10% tax credit for equipment that is depreciated over a period of five or more years. If the equipment will have a three year useful life (autos, trucks, and certain R & D equipment), the tax credit will be 6% of the cost of the property rather than 10%. These new tax credit rules take effect in 1981—including property that was acquired before the law was passed. (It was signed on 8/13/81.)

There was no specific change relative to claiming the tax credit on the full cost of a system that included both hardware and software. However, if the tax credit is claimed on the software because the price is combined with the hardware, then the buyer must depreciate the software with the hardware. If the software is purchased separately, and is licensed rather than purchased, then the full software cost can be deducted in the year of acquisition.

New Rules For Defining Leases.

Taxpayers and the IRS have been arguing for years about whether a lease is really a lease or just a method of financing an equipment purchase. The new tax law attempts to simplify some of the complex rules that have cropped up in this area of controversy. *Basically*, the parties must clearly agree that the transaction is a lease and the lessee must not acquire ownership of the property at any time during the lease. The lessor must be a corporation and must have an investment of at least 10% that is "at risk" in the investment. Generally, the property must be new property.

About the author: Vernon K. Jacobs is a CPA who practices as a tax consultant in the Kansas City area. He is the editor of *Tax Angles*, a nationally circulated tax planning newsletter, and he is the author/publisher of the *Financial Systems Report*—a monthly six page report about computer systems for financial specialists. In his spare time he develops tax-oriented computer programs for desktop computers. A copy of either of his newsletters can be ordered from Research Press, Inc., P.O. Box 8137-P, Prairie Village, KS 66208. Send $3 for each sample to cover postage and handling costs. ☐


apple computer
Authorized Dealer

ATARI
A Warner Communications Company

HEWLETT PACKARD

data systems

ZENITH

NorthStar

commodore

AUTHORIZED DEALER OF
alpha micro

SOFTWARE
COMPLETE SYSTEMS ON SALE
COMPUTER BOOKS
MAGAZINES...

BYTE SHOP
2605 2ND. AVE. 622-7196

Computers & Law

IN the United States as well as in Europe, "an artificial legal distinction is growing up between computer program inventions and other types of inventions," says James A. Sprowl, a research attorney at the American Bar Foundation and an expert on computers and law. "This distinction is not supported by the realities of technology, and it is one that may give rise to serious difficulties in future years."

This problem is the subject of Sprowl's review article in the current, no. 2 issue of the 1981 *American Bar Foundation Research Journal*, prompted by the publication of Bryan Niblett's *Legal Protection of Computer Programs* (London: Oyez Publishing Ltd., 1980). Since U.S. patent law originated in and still closely parallels British law, Sprowl believes that recent U.S. Supreme Court decisions should be appraised in the light of Niblett's insights.

> "Five members of the court held that an invention that included a novel computer program was patentable..."

Legislation may have already pushed things beyond the point of no return in England and Western Europe, where computer programs cannot be patented, observed Sprowl. But U.S. Supreme Court decisions on the patentability of computer programs indicate there is still time to reconsider where things are heading in the United States.

Niblett, a computer scientist and a barrister, asserts in *Legal Protection of Computer Programs* that any law prohibiting the patenting of computer program inventions may be circumvented by constructing and patenting the same invention without using any computer programs. Sprowl agrees that this is possible, since one can always produce a network of transistors and wires which duplicates the performance of any programmed computer. Circuits constructed from transistors and wires have always been patentable. Thus any law prohibiting the patenting of computer programs looks to the form, rather than the substance, of an invention in determining its patentability, explains Sprowl.

What has resulted in Europe is that if an inventor chooses to express his novel ideas in a computer program, his ideas may not be patented; but if he expresses those same ideas in a transistor-and-wire network, they may be patented. "Perhaps it is time to consider whether this is a good course to follow in view of the importance of computer programs to our modern society," warns Sprowl.

Laws that allow for patents only on the "hardware" (transistor-and-wire-network), as opposed to the "software" (computer-program), components of computers run counter to recent developments in computer technology.

> "The U.S. Supreme Court has not yet prohibited the patenting of all computer programs..."

To take an example, with the development of the "microcomputer," the line between hardware and software has shifted in the direction of increasing amounts of software. Only the most primitive of basic machine operations are still performed by transistors and wires. But under a law holding computer programs to be unpatentable, the microinstructions that have come to replace what used to be transistors and wires may not be patented.

The U.S. Supreme Court has not yet prohibited the patenting of all computer programs. In *Diamond v. Diehr* (1981), five members of the Court held that an invention that included a novel computer program was patentable, while four dissenting members could see little difference between Diehr's invention and an invention the Court held to be unpatentable only three years ago in *Parker v. Flook*. What the Court has prohibited is the patenting of any step-by-step solution to a mathematical equation.

However, once doubt is raised about the patentability of any computer program inventions, Sprowl argues that consistency requires us to look back at nonprogram inventions constructed with electronic circuits to see if the same problems do not exist there. Sprowl concludes, for example, that the prohibition against patenting algebraic equations applies to all types of inventions, not just to computer programs.

In Western Europe "the legislatures are creating a situation in which how an inventor chooses to express his ideas," Sprowl explains, "not only affects the patentability of those ideas but also affects whether those ideas will infringe someone else's patent." "Can a patent issued on an invention implemented using transistors be infringed by a programmed computer?" "Will digital computer implementations of television systems infringe patents covering transistorized implementations of those same systems?" Such consequences should follow but will not, warns Sprowl, if patentability is determined by the form of an invention rather than by its substance.

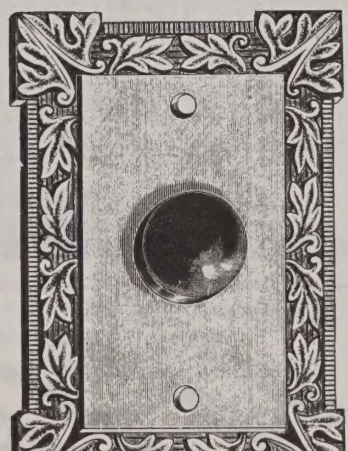
> "If an inventor chooses to express his novel ideas in a computer program, his ideas may not be patented..."

Sprowl does not suggest that all computer programs should be patentable. He recognizes that it may be appropriate for the courts to expand some of the existing categories of things that may not be patented to include such things as commercial accounting systems if public policy so requires. But any such expansion should look not to the form but to the substance of an invention.

Sprowl's "A Review of Niblett's *Legal Protection of Computer Programs* and *Diamond v. Diehr* and Some Thoughts on Patenting Computer Programs" is offered as valuable scholarship but not as a reflection of any position taken by the Foundation. Subscriptions to the *American Bar Foundation Research Journal* ($20/year) or single copies ($5.50) are available at:

1155 East 60th Street
Chicago, Illinois 60637
(312) 667-4700.

Reprinted from the *ADCIS News*, Vol. 14, No. 4, July 1981, Association for the Development of Computer-based Instructional Systems, Computer Center, Western Washington University, Bellingham, Washington 98225.□



Legal Book

THE legal issues associated with the creation, distribution, and protection of software are the subjects of *The Software Legal Book*, by Paul S. Hoffman, a new book published by Carnegie Press, Inc. Prompted by the explosive growth of the software industry, *The Software Legal Book* provides essential legal information in easy-to-understand nonlegal language.

The Software Legal Book was written to assist software developers, managers, and lawyers by integrating important legal concepts with "real world" applications of these concepts. The book begins with a brief primer to introduce the non-DP professional to the software area and commonly used jargon. Guidelines for selecting a protection route are next addressed, including copyright, patent, trade secret, and coding the software product to protect proprietary rights.

Following sections examine software as a product and basic contract factors:

- Ownership of software and software modification.
- Pricing considerations.
- Seller/buyer product definitions.
- Deliverables, pricing, and payment.
- Income tax considerations for buyers.
- Installation and acceptance.
- Warranties.
- Excusable delays.
- Patent and copyright clause.
- Contractual protection of proprietary rights.

The special contract situations of bundled systems, third party software and leasing, price options, and arbitration are also covered in detail. *The Software Legal Book* concludes with techniques in the development and organization of software form contracts, with samples of each type discussed.

> "An invaluable aid to EDP professionals, managers, and lawyers..."

An invaluable aid to EDP professionals, managers, and lawyers who must confront the legal dilemmas associated with the purchase and sale of software products, *The Software Legal Book* is looseleaf-bound to accomodate annual updates.

Paul S. Hoffman is a practicing attorney specializing in computer law, particularly in the area of software contracts. A graduate of Harvard Law School and a Certificate of Data Processing holder, Mr Hoffman serves as 1980-1981 Chairman of the Science and Technology Section of the American Bar Association and is the editor of *Law Office Economics and Management*.

The Software Legal Book, by Paul S. Hoffman, $59.00, 179 pp. (1981).

Reprinted from the *ADCIS News*, Vol. 14, No. 4, July 1981, Association for the Development of Computer-based Instructional Systems, Computer Center, Western Washington University, Bellingham, Washington 98225.□

CENTRAL COMPUTERS

Clearance Bargains --Existing Commodore Stock:
CBM 2001, 32k - $995. CBM 8032, 32k - $1095.
4040 Dual-Disk drive $995. 2022 Printer $595. Vic-20 $270

ATARI • ALTOS • NorthStar
EPSON • PAPER TIGER • ANADEX • NEC

EPSON MX-80 PRINTER $595.
See the new NorthStar "ADVANTAGE," the first integrated desktop computer with full graphics, 2 double-sided double-density drives, and bit-mapped 12" display. It's a WINNER!
GAMES • BOOKS • MAGAZINES • CALCULATORS
SEE US and let's get acquainted!

Sales & Service
Week Days 10-9, Sat. 10-5
3836-124th Avenue SE
Bellevue, WA 98006
Factoria Sq., near Barnaby's
I-90 Exits: Richards Road
746-5227

Confutation

The Commodore VIC. Not yet seen by me, but at $300 a nice cheap BASIC machine with a full-size keyboard. Attaches to your TV and has BASIC built in. More memory than the Sinclair, though heavier. I don't think it does upper- and lower-case letters, and it is meant to be used with tape casettes rather than disk storage. So word processing and full-scale computing are out. But for writing and running BASIC programs it should be fine.

The Radio Shack Color Computer. This is a machine in the class of the Atari 400—a machine designed for the games market with good color graphics. What is particularly attractive about it is that it uses the powerful 6809 processor, and the local 68xx users tell me that if (lowers voice) you are willing to do nasty things which might void your warranty there are cheap ways to add the various tack-ons to make this more than a games computer. But again, still a bit short of something you can build up into a full-scale system, though just on the borderline. It has an upper-case only keyboard and a 16-line by 32-character screen display. That's the price you pay for the nice graphics. Disks and such available to add on, but when you do it becomes not quite such a bargain. Discounted from $400 for the cheapest unit (4K of memory).

The Digital Research Big Board. So you want to build your own computer and you have some facility with a soldering iron? How about the Big Board? For only $650 (plus $150 for the CP/M operating system), Digital Research of Texas (not the Digital Research who wrote the CP/M system) sells the Big Board as a kit. For that you get a single board and parts which make up a Z80 processor, 64K of memory (that's as much as you usually can have on any ordinary microcomputer), a disk controller circuit, and a video display circuit. Add a couple of disk drives (about $400 each these days), case, power supply and a terminal (not so cheap) or a keyboard and screen, and you've got a full-scale microcomputer (I know that sounds like a contradiction in terms). Rumor has it that the new Xerox 820, a $3000 machine, has the Big Board inside! Reputed to work, though harder to put together than a Heathkit.

> "Which magazines should you subscribe to?"

The Zenith Z19 (Heath H19) Terminal. At about $800, a very nice professional-quality terminal with lots of- features which make it nice for 'screen-oriented' editing, which is the only nice way to edit. There are lots of other good terminals at about this price, but this is the one I like. But look around. The most important thing is that you have to like the feel of the keyboard and the look of the screen. Try them out before deciding.

The Zenith Z89 (Heath H89) Computer. Built into the same box as the Z19, so it contains a full-size professional terminal built in. Also 48K of memory, a Z80, and one 5-inch floppy disk. A convenient package for about $2300. If you get it, run CP/M on it, not the Heath operating system. Of course, most full-sized microcomputer systems work well, and this is only a personal favorite of mine. So don't take this too seriously—but don't buy without giving the Heath (oops, sorry, the Zenith) a look! A number of good software packages are available for the Z89 very cheap.

Magazines. Which magazines should you subscribe to? *Byte* is the advertising standard—if you want to see all the hardware ads get it. A bit overtechnical in its copy, but getting better, and at such a rapid rate that some people actually buy it for the articles! *Creative Computing* is fun and unpredictable. Mostly devoted to low-level software (games, education, etc.). For the true aficionado, I recommend *Microsystems*, but those people don't need my advice anyway—they've seen all the mags already. And what about *Northwest Computer News*? That's what you're reading.

Software. Obviously this depends on the machine. If you have a Sinclair ZX81, you're not going to be running WordStar on it! A few suggestions:

- Microsoft BASIC—tried and true.
- BDS C—a nice cheap compiler of a structured language (a bit like Pascal).
- Any good screen-oriented editor. Any other kind of editing is like hitting yourself on the head because it feels so good when you stop.
- Any good text formatter for making nice paragraphs, margins and centering.

Remember to be careful, caveat emptor, and all that. If you are captured, we will deny any knowledge of you—you're really on your own! Which is why you should talk to a lot of people. A good way is to come to computer club meetings. You will never anywhere be asked if you are a member, and there are lots of people whose opinions will cancel each other out. Maybe what remains is the truth. □

Tips

Answers.

"Confused and have questions? Don't know where and how to get the best buy for the dollar? For $3.00 per question we will answer each question you have."

That's the offer made by the Library of Software/Hardware. To set up your account, send your name, address, phone number and the type of computer system you have (including type and model of disk drives, cpu, etc.) to P.O. Box 894, Fresno, CA 93714.

Pocket Computer Newsletter.

For hand-held and pocket computer owners, a newsletter that may be of interest is *Pocket Computer Newsletter*, P.O. Box 232, Seymout, CT 06483. Edited by Nat Wordsworth, published by SCELBI Publications, it contains programs, hints, technical details, and notes on the pocket computer industry and related products. Contact the editor for subscription information.

The Bubble Bursts.

National Semiconductor Corporation has become the third U.S. manufacturer this year to drop all magnetic bubble plans. Following the leads of Rockwell and Texas Instruments, this leaves only Intel to manufacture bubbles in the U.S. with several Japanese firms also in the market. Motorola is still developing bubble products, for now.

From the *Denver Amateur Computer Society Newsletter*, October 1981.

Fair Schedule

1981 PERSONAL COMPUTER FAIR
SCHEDULE OF SPEAKERS

Saturday
11 am Bill Snow of MOSTEK 'Assembling Your Microcomputer System'
12 pm Dave Hyder of Motorola 'The 6809 Microprocessor'
1 pm Randy Bolster of Intel 'Magnetic Bubbles'
2 pm Randy Bolster of Intel 'The Intel 8088, CPU of the new IBM Personal Computer'
3 pm Bill Snow of MOSTEK 'Microcomputers in Real Applications'

Sunday
12 pm Dave Hyder of Motorola '68000 Technical Presentation'
1 pm Mike Parker of Digital Equipment Corporation
2 pm Mike Parker of Digital Equipment Corporation

Many of these presentations will include films, video tapes and slides. More talks will be scheduled in the empty slots. □

Join us!

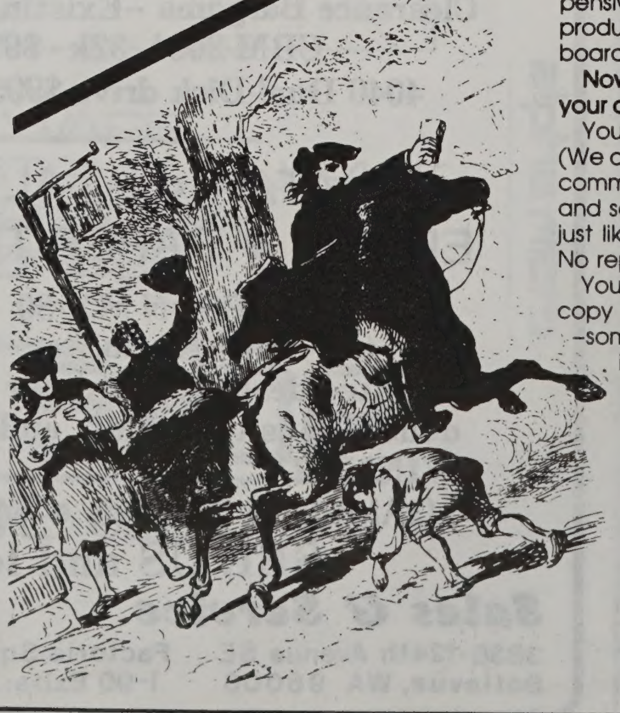
You get a lot for your money.

You get:
- This paper
- Access to cheap timesharing
- Informative meetings
- Discounts at stores
- A Computer fair
- A network of helpful people
- and much more.

It's a bargain. Write out your check for $10.00 today. The form is on page 2.

Announcing a Revolutionary Idea

Use Your Computer to Set Type!



You've probably noticed how much better the **Northwest Computer News** looks since it's been **typeset.**

If you produce a newsletter, technical manual or manuscript, type offers you a variety of styles, sizes and formats. **Ideas which are important can be set in boldface.** Notes can be set small.

Most important, people are more likely to read your words when they're set in type–they have more impact.

But having your documents typeset has never been inexpensive, either in time or money. The words you laboriously produced with your word processing software must be keyboarded again. And your copy must be proofread again.

Now the Type Connection gives you the chance to use your computer system to do most of the work of typesetting.

You can send your text to us by ordinary telephone lines. (We can receive from almost all computers with appropriate communications software.) We add the typesetting codes and set your type on our EditWriter 7500 phototypesetter–just like the **Northwest Computer News.** No rekeyboarding. No reproofreading.

You can save 20 – 50% in cost, depending on the job. Your copy will also take up less space than your printer output –sometimes as much as 50%–so you can save on printing and mailing costs as well.

If you'd like to find out more, call Steve Werner at the Type Connection, 325-3434.

the type connection

Damm Fine Printing • 1240 South Jackson
Seattle, Washington 98144 • (206) 325-3434

Book Review

Programs for Beginners on the TRS-80
by Fred Blechman
Hayden, 1981, 150 pages, $8.95
Reviewed by Dick Seymour

This book provides 21 programming examples for the Radio Shack TRS-80 Model I and III. It is aimed at the true beginner. Each program is presented in a separate chapter. Every chapter is opened with a quick list of what topics will be demonstrated by its program. These buzzwords should be skipped until after you've read the chapter. . .then you can find out what computerniks call what you just did.

Then comes a one paragraph description of what general area the program will address. Some of these are quite clear while others are very vague. Some are simply 'how to run it' descriptions.

Next comes the 'explanation' section. This makes up the bulk of the chapter, and is usually a step-by-step description of what the program is doing, and why. It does what programmers call a 'walk through' by taking some sample numbers and performing the steps the program would if it were running. This is an excellent way to learn how a program works, and how to trace your steps when a program doesn't work.

> "I have quite mixed feelings about this book. . ."

The programs are presented in a type-it-as-you-see-it form. Listings are provided, along with photos from the screen of sample runs. Once in a while the screens don't match the listings. The descrepancies are minor, but a truly lost beginner might wonder why their screen didn't match the book.

Following the explanation is a short list of suggested modifications. A few of these present the author's programming quirks as hard limits to growth. An example of this is in chapter 19. If you use line numbers 5000 and up to replace his 500 and up, you will not meet the expansion limit he describes. Each chapter ends with a dictionary of the variables used in its program.

At the end of the book are four appendices. These range from a copy of the Video Worksheet (where @641 puts you), through a decent cassette tape switchbox, to programming notes on Level I/II conversions and some handy 'slick tricks'.

Well, that's what's in it, but how good is it? I have quite mixed feelings about this book. What the author is trying to do I agree with completely. How he does it ranges from very well, through good, occasionally down to disgusting (chapter 2) and once (page 4) to dangerous. How can a programming book be dangerous? By inviting the 'beginner' to remove the back of their TV set to adjust the image centering. If you're tempted to do this, find a friend (or local TV shop) who's used to such things and watch them while they do it. TV sets can bite you with lots of electricity, or by imploding picture tubes (his method is to twiddle the centering magnets on the neck of the tube, with the power on).

So, how are the programs? I'd rate ten as 'good', nine as 'ok' and two as 'weak.' Considering most of the books I've seen, that's pretty good. Experienced programmers should beware that those ratings are made with a beginner in mind. You might find one or two handy hints somewhere in the book, but not many more.

> "The main strength of this book is the explanations of 'how'. . ."

How are the explanations? Since these are the meat of the book, I'll be a little more critical. Some (such as chapter 13) don't explain WHY the program really works. This example involves a date calculation routine someone sent him. He used it, but mentions in a footnote that he doesn't know why it works. Chapter 14 develops this theme by presenting the algebra of mortgage calculations, without explaining WHY the equations are shuffled to the given form.

Chapter 15 presents a program whose central reason for existence is to choose how long to hold your doctor or dentist bill before paying it. Chapter 2 is just plain crude. Chapter 21 talks about 'up arrows' in the text, but the listing shows '[,' without any explanation for the poor 'beginner.' That's the hardest part of writing to beginners—you have to fill as many holes as possible, especially the ones you no longer see yourself.

The main strength of this book is his explanations of 'how.' Its main failing is his lack of explanation of 'why.' Homework for the week: where did he get the constant '89,' which is the crux of chapter 18?

Overall, I like what this book is trying to do. It teaches programming by example, with leads for growth. A cassette tape of the programs is available, but I'd recommend typing them in by hand. This will teach debugging techniques as you try to find the elusive typos. The 'walk-throughs' will provide the information needed to understand the basics of the programs, although there are a good number of 'tricks' buried in the code which would be handy to have explained as general concepts for use in other situations.

Should you buy this book? You'll have to answer that one yourself. Go to a bookstore (it's available everywhere—blue cover) and read a chapter or two. Flip through the pictures and listings. Do you want to do what he shows? Do you like how he writes? If so, buy it. If you find the programs too simple, too repetitive or too boring. . .don't.

Most of the programs deal heavily with getting the TRS-80 screen to perform prettily, so many of the programs and explanations just don't apply to other systems (including Color Computers). Items of worth, such as the unexplained Julian Date routine can be copied onto the back of an envelope at the bookstore. ☐

Some Nice Products

by Joe Felsenstein

Well, if you insist on being interested in buying something, I suppose we'll have to talk about what. But don't say I didn't warn you. The woods are full of gadget buyers who spend $2000 and then are not sure what they expected. After they can't rememmber why they bought it, they finally sell it. A monstrous waste of time.

But if you are interested, I assume that means that you have thought over what you want a computer to do, and you have also looked into what kinds of software (that's programs, folks) can do it, and then what hardware can run that software. I assume you've gone through all of that, because if you haven't, then you're an even greater fool than I am.

Not knowing what you want, or having time to find out, let me just make a quick list of some products that impress me. Maybe you will find among them one that meets your requirements. Let's go from the least expensive upwards.

> "Would you believe that a kit version goes for $99. . ."

The Sinclair ZX81. This is just released in the US, an offspring of the ZX80 which has been out for over a year. It is a tiny plastic package containing a Z80-based computer for only $150 (no, that's not a typo for $1500!). You hook it up to your TV set and can write programs in BASIC. Attachments allow saving programs on cassette tape, and a small printer is due out soon. Of course, the tiny keyboard is upper-case only and the screen layout is small, but what do you want for the cost? If you want to do word processing, it is not for you, but if you want to buy a very small cheap computer for the kids to play with and write BASIC programs on, maybe you should look at it. Would you believe that a kit version goes for $99?

The Hand-Held Computers. Under this heading I include the Sharp hand-held computer (which is also sold by Radio Shack under its label) and the more recently-released Casio machine. Both now about $190-$200. These are becoming great favorites of engineers, and they and their offspring are going to kill off the 'programmable' desk calculator. The Sharp and Casio machines run BASIC, have a one-line liquid-crystal display, have constant-memory to enable programs to be preserved while the machine is turned off. Like the ZX80 and ZX81, they have only about 1-2000 characters (bytes) of memory, but that is enough for rather large programs, at least by hand-held standards. Again, not for text processing, and the one-line display is too small for games, but a great package for the engineer. The first of a future generation of hand-held machines (hand-held VAX, here we come!)

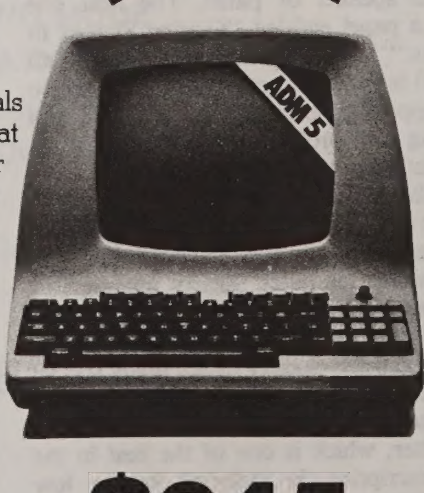
~~$895~~

Now it's a lot cheaper to be Dumb.

~~$995~~

The only way to improve on LSI Dumb Terminals was to lower their prices. And that's exactly what we did. So now, you can buy the ADM 3A for a mere $595, and the ADM 5 for $645. That makes the world's best selling Dumb Terminal the world's best priced terminal.

But don't let the price fool you. They're still the same, dependable Dumb Terminals they've always been. So, if you're in the market for a video display terminal, call us.



$595
Quantity one

LEAR SIEGLER, INC.

$645
Quantity one

WYLE
DISTRIBUTION GROUP

1750 132nd Ave., N.E., Bellevue, WA 98005
Phone: (206) 453-8300

Electronics

the WPPSS plants, we will still have bargain utility rates because of the strong hydroelectric base.

The State faces fierce competition from other states and countries for the attention of the desirable industries. Tennessee gives away land, California and North Carolina have state supported technological research facilities in conjunction with the private sector. Research centers are being created for the electronics industry by those states with private financial involvement. The industry finds that very attractive. We have nothing like that to offer.

> "The Legislature is not accustomed to acting that quickly and with such cooperation from all parts of the State. . ."

In Japan, it costs 7½ percent for small companies to borrow for expansion funds. That is the result of government subsidies. Our government has decided it wants to get out of similar activities like the Export-Import Bank, SBA, FHA, and other programs. On the state level, the State Economic Assistance Authority makes funds available to localities for roads and sewers or other services as seed money. A city like Puyallup needs that kind of help to handle the growth. The Economic Assistance Authority, which was used to get money into the Fairchild project, has not been funded for the last six years. The agency will go out of existence next June.

Another incentive is sales tax deferral for three years on new plant and equipment. If you want to put up a new plant, the State charges 5 percent on the labor, the materials, equipment, construction, everything. In our state, you can have the sales tax deferred for up to three years and pay them back over a five year period. With the interest charged, the State comes out ahead. However, in these times of scarce revenue, the legislature has marked this program to be eliminated. 36 other states do not even have sales tax on development.

Our liveable neighbor to the south doesn't have sales tax at all. They have some electronics firms, though, and one of the reasons is that they have industrial development bonds. The bonds are federal tax incentives to allow municipal bonds to be used for private sector investments. Shaving a few points off the interest rate encourages businesses, especially small ones, to grow. We are the only state in the Union that does not have the authority to grant those bonds. HJR-7 would solve this issue.

We are putting together an industrial advisory group to help tell us what needs to be done to attract more high technology industries.

There are some problems about locating in the area other than those faced by the two majors we have now. The electronics industry can cope with most problems but there are some variables that may be more difficult. There is a shortage of technical people available to work in this developing industry. Right now we have a survey which shows that the companies expect to employ twice the number of professionals and paraprofessionals they do today, conservatively about 6,000 more people. That does not take into consideration any new firm's requirements who may move into the State.

We are not prepared as a state to face this challenge. Our educational institutions have decided for a variety of reasons that they cannot meet this demand for highly trained professionals. We see a decline in enrollment and cuts that will seriously effect their capabilities. Already, some institutions suffer from the lack of equipment and poor faculty recruiting capabilities.

Its a problem that we can't just sweep under the rug. Research and development, good faculties, good facilities are essential for a good technical climate. We have had that in the past and we have pockets of it now, but it is deteriorating before our eyes.

We don't have a large reservoir of available land. There are companies whom the state failed to attract because land sites are too far from transportation, land is underdeveloped, has not been rezoned, or there are no sewers, roads or other facilities.

We have attitudes, laws on the books, and a recalcitrance on the part of localities that preclude things from happenning quickly. This will be changing as attitudes change. Laws will be administered differently, and changes in the land-use regulations will come.

A greater impediment is the lack of money in the public coffers for public development. Local governments are simply busted. They just don't have the tax base or resources to encourage growth. If we are going to reindustrialize the U.S., we require substantial public works investments by federal, state, and local governments. But the current trend is that all public expenditures for all purposes should be curtailed. Many of the things we take for granted, the interstate highways, the railroads, power supplies, etc. are there because of huge public investments. We will not see this economy revitalized unless there is a large public sector investment made in public works and education.

A greater impediment is the lack of money in the public coffers for public development. Local governments are simply busted. They just don't have the tax base or resources to encourage growth. If we are going to reindustrialize the U.S., we require substantial public works investments by federal, state, and local governments. But the current trend is that all public expenditures for all purposes should be curtailed. Many of the things we take for granted, the interstate highways, the railroads, power supplies, etc. are there because of huge public investments. We will not see this economy revitalized unless there is a large public sector investment made in public works and education. ☐

NW Computer Society

THE Northwest Computer Society holds public meetings twice a month: on the first and third thursdays of each month. They are held at the Seattle University Library Auditorium at 7:30 pm. Seattle University is located in downtown Seattle at 12th and Columbia. See the map on page 2 for exact directions.

The first meeting of each month is always a presentation with a special speaker or panel. The next one (December 3rd) is a panel entitled "Getting Started In Personal Computers." The second meeting of the month (the third thursday) is more informal. It's a chance to find out what's happening, exchange information, and talk to people. Bring your problems down and get them solved, or your solutions and share them.

These meetings also have themes. The November 19th meeting will feature discussions about Nordata. This is a timesharing company which makes computer time available to Northwest Computer Society members at very low rates (75 cents an hour!) We'll be talking about how to get started, what you'll need, and how to use it.

The Northwest Computer Society offers many special features. Besides our meetings and Nordata, we offer group purchases and discounts at certain stores. We publish this newsletter, which is one of the best in the country. Your subscription is included in the low membership fee of $10 per year. In addition, we sponsor special events like the Personal Computer Fair and our annual Flea Market (the cheapest computers in town.)

Drop by the Northwest Computer Society Booth and join up. You'll find it worthwhile. And drop by our meetings; there's a lot of reasons why.

Ken Berkun, Fair Chairman

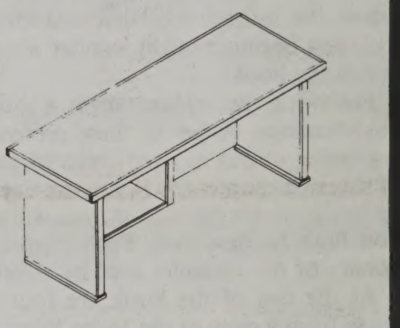
ACME BUSINESS COMPUTERS
1727 E. Sprague
Spokane, WA 99202
(509) 535-1111
ZENITH DATA SYSTEMS SPECIALISTS

SOFTWARE for ZENITH 89's W CP/M™ 2.2
misc. games on 5" disk - **$8.00** ea.

- **Zenith Data Systems Software**
- **MicroPro Software**
- **Reliable Series Software**
- **Mailist** prints labels, control sheets plus will merge with MAGIC WAND™ — **$95.00**
- **Salesman Prospect File** keeps track of prospects, incl. features of MAILIST — **$145.00**
- **Microgram**

Patient Recall	**$150.00**
Client Control	**$100.00**
Medical Office Package	**$2,000.00**
Dental Office Package	**$2,000.00**

- **Memorex Disks** 5", 10 each 3403 10 hardsector — **$26.00** plus shipping.*



COMPUTER WORK DESK
$290.00 F.O.B. Spokane, WA

• **Reliable Series** and **Microgram** software come with complete documentation, but require MBASIC™. Program bugs are fixed **FREE** if any slipped through our testing. Notices of enhancements will be sent as new releases are available. Users will be charged a modest fee for updates. Software prices include postage and handling. We accept VISA and MASTERCHARGE. Prices are in effect till January 1, 1982.

tm Magic Wand trademark of Peachtree Software.
tm CP/M trademark of Digital Research
tm m BASIC trademark of Microsoft
*Subject to change when present stock exhausted.

ACME BUSINESS COMPUTERS
ZENITH DATA SYSTEMS SPECIALISTS

MAGNOLIA MICROSYSTEMS

CP/M™ DISK SUBSYSTEMS
FOR THE HEATH/ZENITH 89 COMPUTER

Corvus Winchester Disk Systems
Daisy-Chain 4 drives for up to 80 MBytes
Connect up to 8 '89s using a Constellation

5 MByte	**$3750**
10 MByte	**$5350**
20 MByte	**$6450**
Constellation Multiplexer	**$900**
Interface cards for additional '89s	**$350**

8" Double Density Floppy Systems
Use up to 4 8" and 4 5" drives!

Single Sided: 1 drive (594K)	**$1595**
2 drives (1188K)	**$1995**
Double Sided: 1 drive (1210K)	**$2095**
2 drives (2420K)	**$2695**

5" Double Density Floppy Systems
Use up to 4 5" and 4 8" drives!

48tpi: Single Sided: 1 drive (162K)	**$945**
Double Sided: 1 drive (343K)	**$1095**
96 tpi: Double Sided: 1 drive (700K)	**$1295**
2 drives (1400K)	**$1995**

Mixed Winchester and Floppy Systems
Mass Storage with Floppy Backup

5 MByte + 96 tpi DS 5" (700K)	**$4495**
5 MByte + DS 8" (1210K)	**$4995**
10 MByte + DS 8" (1210K)	**$6495**

Each system includes everything needed:
- Disk I/O Card and/or Double Density Controller Package including CP/M 2.2
- Disk Drives in cabinet with Power Supply and all necessary cables

Ask for these systems at your local Heathkit or Computer Store, or order direct.

MAGNOLIA MICROSYSTEMS, INC.
2264 - 15th Avenue West
Seattle, WA 98119
(206) 285-7266 (800) 426-2841

See our other advertisements for details on the interface and double density controller boards used in these systems. CP/M is a trademark of Digital Research.

Word Masters T.M.
Pioneers in Teletypography
Established 1975

Specializing in:
- BOOKS
- MANUALS
- CATALOGUES

- CONSULTING
- DESIGN
- WRITING/EDITING
- OCR
- TELECOMMUNICATIONS
- WORD PROCESSING
- TYPESETTING
- PRINTING

Information Management
and Processing Specialists

"Unparalleled Quality"

632-6670
820 N.E. 45th
SEATTLE, WA 98105

INTRODUCING ...
DIGICALC
THE ELECTRONIC SPREADSHEET
for
DEC COMPUTER SYSTEMS

* AUTOMATIC CALCULATION
* EXTENSIVE MATH FUNCTIONS
  ALGEBRAIC
  LOGICAL
  FINANCIAL
  SCIENTIFIC
* TEN KEY NUMERIC DATA ENTRY
* EXTENSIVE **HELP** AT TERMINAL
* INCLUDES SELF TEACHING MODE
* WORKSHEET CONSOLIDATION
* VARIETY OF "BOARDROOM" QUALITY REPORTS
* SAVES AND RECALLS WORKSHEETS

CALL TODAY AND ARRANGE A DEMONSTRATION
FOR YOUR BUSINESS

WHY SYSTEMS INCORPORATED
REDMOND, WASHINGTON
881-2331

ALMAC/STROUM ELECTRONICS AND COMPUTER STORE

New Location in Bellevue's Eastgate Area.
14360 Eastgate Wy (206) 643-9992

We are open **9-5:30 Monday through Friday.** • 763-2327

Hewlett-Packard Calculators and related software available beginning in October. Come by our new location and chech out our newest line of calculators by *H-P*

TEXAS INSTRUMENTS
INCORPORATED

All *Texas Instruments* calculators on sale for back to school savings. Also look for added savings on selected models through rebates direct from *Texas Instruments.*

COME VISIT US IN OUR NEW STORE.

JOHN MARSHALL
Systems Sales Specialist

WYLE
DISTRIBUTION GROUP
SEATTLE DIVISION • 1750 132nd AVENUE N.E.
BELLEVUE, WASHINGTON 98005

Portland (503) 241-1979
Oregon WATS (800) 426-2956
206/453-8300

Wam Wye inc. data processing
4221 · 4th NW · SEATTLE · WA · 98107
(206) 784-0669
MICHAEL BAEHR · president

MILDRED L. CULP

Executive Résumés
COVER LETTERS ° STRATEGY COUNSELING

JOSEPH VANCE BUILDING, SUITE 414
SEATTLE, WASHINGTON 98101
(206) 622-0117

James H. Irish, SRA

IRISH and ASSOCIATES
Real Estate Appraisers and Consultants

3248 34th Avenue West
Seattle, Washington 98199
(206) 283-2008

The Northwests' largest exclusive Ham store

Amateur Radio Supply
Amateur Radio parts & equipment

TOM PACE, K7YST
Sales and Service

6213 13th Ave. So.
Seattle, Wa. 98108
206 | 767-3222

Llyle H. Morgan
859-0733

Express Type

- ►Photocomposition
- ►Publication Preparation
- ►Mailing List Maintenance

310 N. Central Suite K
Kent, Wash 98022

LAMBERT ASSOCIATES
☐☐☐☐☐☐
PERSONNEL SERVICES

PHONE (206) 625-0610

1525 FOURTH AVENUE
SEATTLE, WASHINGTON 98101

CHUCK CUSHING

SUSAN ROBBINS

FOSTER & MARSHALL INC.
INVESTMENT BANKERS AND BROKERS
MEMBER NEW YORK STOCK EXCHANGE

(206) 575-4478
TACOMA (206) 952-2152
16400 SOUTHCENTER PKWY.
SUITE 101
TUKWILA, WA 98188

Specializing in Microcomputers For Home, Business, and Education

"THE SMART BOX SHOP"

SS-50
Mark Calkins
Owner
206 / 736-4048

110 No. Tower
Centralia, WA.
98531

206-881-8385

Norman Alexander Levinson
COMPUTER CONSULTANT

P.O. BOX 345
REDMOND, WA 98052

WHY Systems Incorporated
20915 NE 77th Street
Redmond, Washington 98052

DEC COMPUTER CONSULTING SPECIALISTS
-RSTS to VAX up-grade assistance
-System audits, standard sysgens
-Applications design & programming
-VAX & FORTRAN-77 user's courses
-RMS file design & optimization
-VAX & RSTS time sharing

WHY not call us first? **(206) 881-2331**

Leigh J. Huseby
Data Processing Consultant

SPECIALIZING IN HP/3000

(206) 838-1470

31007 39TH SW
FEDERAL WAY, WA 98003